Teacher: Giambanco

Class: Living Environment

Unit: Human Impact of the Environment

Topic: Human Generated Waste

Big Idea: Human activities are altering the planet on a scale comparable to major natural processes of the past.

Essential Question: Should individuals take responsibility for humanities impact on the environment?

NOTE: Several days prior to this lesson, give students a trash log and ask them record everything they throw out.

Aim: Why do human activities affect the planet?

Materials: Student handouts, PPT, smart board, stamp sheets, story of stuff video, white boards, markers

Lesson Overview: Lesson is an introduction to how human activities impact the Earth and its ecosystems. Students will make connections to how they use resources, what results from resource use (e.g., trash, pollution) and begin to examine the unit’s essential question in preparation for the unit’s performance task, a persuasive essay addressing the unit’s essential question.

Learning Objectives: SWBAT:

* Identify how human activities are affecting ecosystems
* Explain why the way they use resources impacts the planet
* Predict how increasing human population will impact the plant
* Outline actions that they can personally take to reduce their impact on the planet

Standards:

* STANDARD 4:  Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.
* CCSS.ELA-Literacy.RST.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9–10 texts and topics*.
* CCSS.ELA-Literacy: Interpreting complex diagrams, writing complex claim, using evidence from diagrams to support a claim

Danielson Rubric Component:

* 3c: students complete and discuss their trash logs, use of video to generate student discussion, multiple opportunities for students to speak with each other about the topic built into the lesson

Differentiation: This lesson visuals, verbal and written supports that identify how students will be working throughout the lesson. This specifically includes the voice volume scale and the modes on each PPT slide. Students will be working in pairs. Checklists, a graphic organizer for organizing review information and post-its are used to help support students. Specifically, the post-its are utilized to create on the spot checklists for students who require additional support and also as a tool for our questions parking lot.

Procedure:

1. Do Now (5 min)- Examining our trash logs

* Have students answer the following questions using their trash logs.

Think-Pair-Share Directions:

Answer this question first without talking to your partner: ***Do you notice any patterns in the amount or type of trash you generated?***

With your partner answer this question second: ***How does your trash generation compare to your partners?***

***CTQ: Where does all the trash you generated go?***

* Differentiation: Modes man and voice volume scale on the smart board
* Verbal prompting for students to get started

1. Pair Work (10 min)- Data Point Analysis

* Project the following three diagrams taken from Mother Jones (July 16, 2012): Charts: What Your Trash Reveals About the World Economy <http://www.motherjones.com/environment/2012/07/trash-charts-world-bank-report-economy/> and provide each student with their own copy to write on
* **MODEL the I^2 strategy for the students using the first (bar) graph)**

Directions:

1. On the graph worksheet, write the phrase: “What I see:” near the right side of your sketch. Record what you see and draw an arrow pointing to what you are describing. – Think about changes, trends, and differences. – Draw arrows to what you are describing. – No “because” statements!
2. Write the phrase: “What it means” underneath the first phrase. Record what it means and draw arrows pointing to what you are explaining. – You should have one WIM statement for each WIS statement
3. Think of the caption as an executive summary. Begin with a topic sentence describing the graphic. Join WIS with WIM to form a short paragraph

NOTE: All the students *should* have a caption that indicates that the amount of waste being generated by humans is increasing and that the US is a leading contributor to the production of trash.

***CTQ: Based on your observations, are there any trends in garbage production?***

***CTQ: If people have been throwing away things for so long, why is there concern in some places now***?

* What are some problems that exist today that did not exist in the past?
  + - ***Differentiation: Modes man and voice volume scale on the smart board***
    - ***Verbal prompting for students to get started***
    - ***Students work in pairs to review and make connections between concepts***

3) Video (20 min)- Story of Stuff

Directions: As you watch the video use Hochman note-taking symbols to take notes on the video presentation. You will be using these notes to complete your summary/ homework assignment.

***CTQ: If we wanted to reduce the amount of waste generated by the current system, which parts if the system discussed in the video would you target?***

***CTQ: The U.S. has 5% of the world’s population but uses 30% of the resources and makes 30% of the waste, is this a problem?***

***CTQ: Think about your trash logs, how do you contribute to the current system, and what actions can you take to change it?***

* + - ***Differentiation: Modes man and voice volume scale on the smart board***
    - ***Multimedia for visual/auditory learners***
    - ***Copies of Hochman symbols on students desk as a reference***
    - ***Printed transcript of video in both English and Spanish for students to refer to later as needed***

1. Summary (10 min)- Anthropocene reading

Directions- Pre-view the reading questions. Read and annotate the paragraphs using the questions as a guide. Be sure to use the Hochman note taking symbols. Answer the reading questions. If you finish early, complete the extension activity. Be prepared to discuss your answers.

***CTQ: Why so some geologists believe that we have entered a new geologic period?***

***CTQ: Why do these scientist suggest the name Anthropocene? Where have you hears similar words?***

***•*** Anthro= people

***CTQ: What role are human activities playing in shaping the planet?***

🡪Human activities are changing the rates of natural processes such as global warming, the distribution of animals, erosion and sedimentation. These changes will result in effects that will last for thousands of years.

***CTQ: What arguments can be made that the Anthropocene epoch either isn’t different from the Holocene, or hasn’t started yet?***

RUBRIC

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| Do Now:   * Has a filled in trash journal * Think-Pair Share   + Student wrote an independent answer down   + *Student discussed questions with partner*   + *Student wrote down what they and their partner discussed*   Pair Work:   * Student wrote an observation (WIS) * Student wrote an inference (WIM) * Student wrote a caption for the figure   Video:   * Student wrote notes about the video using Hochman symbols * Student engaged in the debrief discussion   Summary:   * Annotated the reading using Hochman symbols * Engaged in the class debrief discussion   EXTRA CREDIT:   * Completed the reading extension and questions | Do Now  \_\_\_\_\_\_\_\_\_\_\_\_/ 12  Pair Work:  \_\_\_\_\_\_\_\_\_\_\_\_/ 9  Video:  \_\_\_\_\_\_\_\_\_\_\_\_\_/ 6  Conclusion:  \_\_\_\_\_\_\_\_\_\_\_\_\_/ 6  EXTRA CREDIT:  \_\_\_\_\_\_\_\_\_\_\_\_/ 5 |
| **Total Score: \_\_\_\_\_\_\_\_\_/33 (38)** | |

Trash Log Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Directions:** For at least 3 days record EVERYTHING that you throw out. Each individual item placed in the trash should be recorded on its own line. Be sure to describe what the trash item were made of and whether the item was recycled or not. You should use more than one log if needed.

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**The Anthropocene: Marking Humanity’s Impact BY ELIZABETH KOLBERT** *(abridged)*

Big Idea: Human activities are altering the planet on a scale comparable to major natural processes of the past.

Essential Question: Should individuals take responsibility for humanities impact on the environment?

**Glossary**

**Epoch-** a unique period in the history of the Earth usually hundreds of thousands of years old

**Geology**- the science that studies Earth's physical history, and the processes that change it

**Geologic time**- the period of time covering the formation and development of Earth, especially the period before human history.

The Earth is very old, about 4.6 billion years old. In order to talk about certain periods in Earths very ancient history, scientists have broken it up into epochs. Epochs are periods of Earth’s history that are described by specific abiotic and biotic factors unique to that geologic time period. Scientists are now considering whether to officially designate a new geological epoch to reflect the changes in the Earth that humans have caused. They want to call this new epoch the Anthropocene (Ant-throw-po-seen). At the moment, scientists are calling the time we live in the Holocene- or “wholly recent” epoch, which started about 11,000 years ago. As epochs go, the Holocene is barely out of diapers. Still the Holocene may be done for. People have become such a driving force on the planet that many geologists (scientists who study the Earth) argue a new epoch – the Anthropocene (anthro= human) - has begun.

What is the main idea of this paragraph?

Extension:

In a recent paper published in the Journal of Environmental Science and Technology, a group of geologists listed more than a half dozen processes that are the result of human activities that are leaving a mark on the planet that will last tens of millions of years. These include: habitat destruction and the introduction of invasive species, which are causing widespread extinctions; pollution resulting in ocean acidification, which is changing the chemical makeup of the seas; and urbanization, which is vastly increasing rates of sedimentation and erosion.

Human activity, the group of scientists wrote is changing the planet “on a scale comparable with some of the major events of the ancient past. Some of these changes are now seen as permanent, even on a geological timescale.” According to Barry Richards of the Geological Survey of Canada, “Human activities, particularly since the onset of the industrial revolution, are clearly having a major impact on the Earth. We are leaving a clear and unique record.”

1. Why do some geologist believe that we have entered a new geologic period?
2. Why is this new period referred to as the Anthropocene?
3. Based on the group work reading (model and practice), what human activities are impacting the environment and what are the problems resulting from them?
4. In what ways do ***you***contribute to these environmental problem